

Turbine Engine Pulsed Fuel Injection Utilizing Staggered Injector Operation

Abstract

This invention is a fuel injection control system for a turbine engine. The invention uses at least four fuel injectors operated in groups, having means for injecting fuel in pulses to the combustion chamber of a turbine engine, and an electronic control unit to receive and interpret input sensor signals from a selected operating function of the engine and to generate and direct fuel injection signals to the injectors operated in groups to provide control of the quantity of fuel delivered to the engine and to minimize the periods of no fuel flow to improve upon flame stability during operation at lower injector on-times by pulsing the injectors open and closed in groups rather than in unison. This invention maintains the mechanical simplicity of controlling the atomization and quantity of fuel at the point of utilization and improves upon the stability of the engine by reducing the time period between injections to maintain operating stability. This invention further offers the ability to reduce the frequency of injector operation to improve upon the mechanical life of the injectors. This invention

may be used in many applications where it is desirable or necessary to operate a turbine engine at less than full output such as is encountered in aviation, power generation, and other commercial, industrial, and military uses of turbine engines.